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ABSTRACT

Successive studies conducted in Sweden have shown that linguistic awareness is an important prerequisite of learning to read. In one survey that measured the various aspects of the linguistic awareness of 6-year-old children, a very close connection was found between preschool linguistic awareness and reading proficiency in school. Another study that examined the influence of preschool exercises and games concluded that the capacity for discovering, dividing, and merging sounds could be developed before children actually started to learn to read at school, provided the exercises were properly structured and systematically conducted. Studies now in progress are giving attention to the way in which linguistic awareness is related to other aspects of children's linguistic and intellectual development. The results of one such study show that dyslexic students often find it particularly hard to read constructed nonsense words. In studies of the reading process and comprehension, a technique has been developed for studying reading "on line." This involves a computerized text presentation system whereby only one part of the passage appears distinctly. By varying this presentation, it is possible to obtain a diagnosis of reading proficiency for different readers and to diagnose the text itself by seeing at what speed it can be read. Finally, followup studies of students in grades one through six reveal a connection between self-image and reading since the students who had overcome their reading problems by grade six displayed a positive self-image development. (HOD)

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AUGUST 1984 FIELD - SUBJECT 1984:5

CURRENT PROJECT
Learning to read
Linguistic awareness and reading
Dyslexia

TITLE OF PROJECT LEARNING TO READ

Reading in one of the most important things a person learns during childhood. Unfortunately, however, far too mary children leave school with insufficient reading proficieny because their learning has not been successful. The project on learning to read is aimed at improving our understanding of things which can prevent some pupils from achieving good reading proficiency.

The following are some of the questions which we have asked ourselves.

- What are the intellectual and lingustic requirements involved by learning to read?
- Is it already possible in pre-school education to prepare the ground for learning to read?
- How will pupils who have been unsuccessful at an early stage in learning to read get on later in life?
- What is the relationship between the pupils' self-image and their reading development?
- How is reading comprehension affected by awareness of one's own intellectual activity?
- In what ways do good and bad readers diverge at subsequent levels of school?
- How can one study the ongoing reading process?
- What factors in a text can obstruct good reading?

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LINGUISTIC AWARENESS AND LEARNING TO READ

In order to understand why some children have difficulty in learning to read, one has to analyse closely the intellectual and linguistic requirements involved by our system of writing. Writing is not recorded speech, nor is it learnt in the same spontaneous manner as the spoken language. Learning the written language is more a matter of awareness and insight. One has to pay attention to the language as such, adopting a new attitude towards it so as to grasp the relationship between writing and the spoken language.

When people are talking to each other, their language is for the most part transparent; the focus of attention is not on language as such but on what is being said, on the content or meaning of what is being said. A fluent reader also seems to go straight to the content and meaning of a written or printed passage, but at the first stages of learning to read there is no avoiding the process of actually decoding the words. One has to understand that language consists of words and that words can be divided up into components which are joined together to form words. This concentration of attention on the formal aspect of language we have termed linguistic awareness. In successive studies we have shown that linguistic awareness is an important prerequisite of learning to read.

Some children already begin at early pre-school age to show signs of a dawning awareness of the formal aspect of language. They make up rhymes, play with the language, savour its sounds, begin to understand that words can vary in length, can be divided up into smaller parts and so on. But no two children are alike. Some children display no curiosity whatsoever where language is concerned, even though they can both speak and understand well. In one survey we measured various aspects of the linguistic awareness of 6-year-olds. We then followed the progress of these children during their first years of school, to see how they coped with learning to read and write. There was a very close connection between linguistic awareness in pre-school and reading proficiency in school (the correlation was over +0.70). Thus the progress of children learning to read and write can be quite safely

predicted according to the development of linguistic awareness before they start school.

In another study we found out whether it was possible to influence the development of linguistic awareness by means of specially designed pre-school exercises and games. This study involved several different experimental and reference groups, so that the effect of the actual practice programme could be genuinely evaluated. We were able to conclude that the capacity for discovering, dividing and merging sounds can be developed before children actually start learning to read at school, provided the exercises are properly structured and systematically conducted.

Reading instruction was also followed up in school one year later, to see whether the pre-school training had had any long-term effects. We then found that the pre-school exercises had a positive impact on the first steps in reading and writing at school, at least where certain pupils were concerned. In other words, our studies indicate that children can already be prepared for learning to read in pre-school education, by means of voyages of discovery in the formal aspects of language, without necessarily employing letters of the alphabet and written words. But of course, the very process of learning to read transforms the language in the children's minds, leading them to new insights concerning the formal aspect. In the studies now in progress, we are trying to take a closer look at the way in which linguistic awareness is related to other sides of children's linguistic and intellectual development.

DECODING WRITTEN WORDS

There are two, closely related aspects to learning to read: decoding and understanding. This distinction does not represent a pedagogical instruction. For teaching purposes, perhaps one should not distinguish between decoding and understanding, but the distinction can be useful for research purposes. The fact of decoding and understanding representing different aspects of reading becomes obvious, for example, when we recall how sometimes we can read aloud to children while thinking of

something completely different. We have no idea what we are reading (decoding), but the children seem pleased enough. Decoding proceeds quite automatically, without any understanding being involved! Occasionally, too, one encounters pupils (often of low ability) who can read very fluently in the technical sense but do not appear to grasp a word of the actual content.

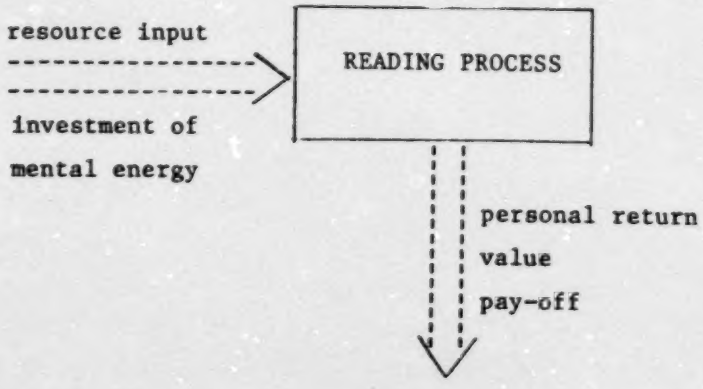
In our project, we are trying to study different aspects of decoding and the way in which it becomes automatic as children learn to read. The main problem in decoding is for the most part unconnected with the identification of letters of the alphabet. The crucial step concerns the way in which the visual information can arouse the internal words, so that the normal linguistic process of interpretation can get started. There is no evading this stage of decoding.

Writing is a code which represents language in a special way. The Morse code for telegraphy is another way. If somebody who is learning to transmit is unable to receive a message, this is probably because he has not attained sufficient skill in decoding the telegraphic signals. It will, of course, be all to the good if the operator acquires a better precomprehension, better knowledge of the world around him and a better vocabulary. But telegraphy will be of little use unless the problem of decoding is solved. This takes a great deal of time and requires large doses of over-learning. The parallel to reading is in fact quite striking.

In one of our studies we have found that dyslexic pupils often find it particularly hard to read constructed nonsense words, i.e. words with no semantic meaning. In this situation it is impossible to refer to a well-established word picture or any intelligible context; instead one is thrown back on phonological decoding of the letters (i.e. running them together) in order to read the words. Frequently, poor readers also have great difficulty in reading intelligible words if they are presented singly and without any linguistic context. With contextual support, they can decode words much better, because then they can make up for their poor automatic decoding by means of guesswork. Rough reading of this kind can work quite well if the context provides

adequate support for the formation of good hypotheses. This rather resembles the situation when we are trying to read very bad handwriting. The context often enables us to work out what has been written. Normal reading of good printing, however, is not a matter of guesswork. The words are rapidly and automatically decoded, so that full attention can be concentrated on the content of the passage. This is the level at which the context is utilised. Poor readers, on the other hand, have to devote their energy to making up for their poorly automated verbal decoding by means of exacting guesswork, with the result that the profounder content of the reading passage is liable to elude them.

Exaggerating somewhat, one can say that there is only one way of learning to read, and that is by reading. Many pupils soon pick up strategies, some more ingenious than others, for the avoidance of reading. If the school safety net is excessively coarse-meshed, it is not to be wondered at that many pupils reach intermediate or senior level with poor reading functions. The main problem, then, is that many pupils, for some reason or other, have not devoted sufficient time and effort to reading. The pedagogical response must then be to arouse their desire to read and to help them automate the technical aspects of reading (decoding) so as to reduce the input of mental energy required. The following simple model shows that the effort which one is prepared to invest in reading must be reasonable in proportion to the personal return obtained from reading.



Parallel to, and without any conflict with natural, enjoyable reading, one can also have individualised exercises aimed at strengthening the automation of decoding. For example, we have "book and tape" and the

method of repeated reading, both of which we have studied closely in this project and found worth using.

UNDERSTANDING

The whole point of reading, of course, is to understand what one reads. Even if the decoding operations function more or less automatically, there is a great deal which can stand in the way of good reading comprehension. Comprehension of a passage presupposes that the reader possesses relevant knowledge concerning the reality to which the passage refers; one must have viable matrices in which to integrate the information; one must have an adequate vocabulary; one must be able to read between and beyond the lines and follow a thread which may not always be visible; one must be able to develop strategies when problems arise, and so on. In other words, a number of superior intellectual functions are required which might be crucial even if one were able to listen to somebody else reading.

In studies of the reading process and reading comprehension, the main focus of attention has generally been on the product of reading. Efforts are made to find out what the reader has apprehended or understood, by asking questions on the passage or by asking the reader to recount or summarise the content. However interesting they may be themselves, studies of this kind tell us nothing about the ongoing process of reading. Or to adopt a more modern turn of phrase, we are unable to follow the process "on line". The on-line studies undertaken hitherto have mostly been concerned with the movement of the eyes from one line to another during reading, or else with observing a pupil reading aloud and recording types of error classified on more or less arbitrary principles. The eyes, however, are not a particularly direct window on the mental life of the reader, and reading errors are not an adequate foundation on which to base an understanding of the intricate processes of interaction between reader and reading passage.

In this project we have developed a new and very promising technique of studying reading "on line". This is a computerised text presentation system whereby only part of the passage appears distinctly. This part

(which we term the text window) moves across the lines of the passage from left to right. By following this moving window with one's gaze, one is thus able to read off the passage and assimilate its content. It is rather like reading by the light of a torch which has such a limited beam that it has to be moved to and fro across the page like a scanner. Outside the field (window) of clear vision, there may be an empty space or dashes to mark the real words of the rest of the passage. Or again there may be groups of letters resembling words on the periphery of vision, with letters resembling as closely as possible the actual words of the passage (which appear when the window reaches that point), so that contour information, length and spaces between words will afford peripheral guidance for the eye.

The point about the window is that one knows with reasonable certainty what point the reader has come to. This makes it possible, for example, to deduce the effect of local variations in the text on reading. It is also possible to vary the speed at which the window moves. Or better still, the reader himself can be allowed to regulate the speed of movement by moving a "mouse" keypad to and fro on the table in front of the screen. As the window moves along the lines, the computer may emit an acoustic signal every now and then, for example when a certain word comes up or at a certain more or less exacting position in the syntactical structure. The reader is then required to react to the acoustic signal as rapidly as possible by depressing one of two buttons in the keypad, depending on the kind of signal emitted. The reaction time and "right" or "wrong" are entered and stored in the computer memory together with the text fragment in the window. This provides an indirect measurement of the load which part of a reading passage will tolerate. If the subject reads aloud, it is also possible to calculate the span between eye and voice.

The computer signals need not only be acoustic. The window can also suddenly come to a halt in the middle of the passage and be filled with a critical word in a different typeface. The reader will then be required to decide as quickly as possible whether or not the word has appeared in the passage previously. Another task we have tried is for the reader to depress a button as soon as certain words, e.g. the main

character in a story or some reference to that character, crops up in the continuous passage. Reaction times to the various signals and tasks can indicate how the reader is loaded or relieved by different syntactical constructions or accumulations of thought-units in the reading passage. In this way we can obtain detailed knowledge concerning the things about a reading passage which impede and facilitate reading.

In this way, then, we have acquired a very flexible and useful technique for on-line studies of various aspects of the reading process. By varying the window velocity and/or the breadth of the window, or allowing the reader himself to regulate the speed at which the window moves, one can obtain a very rapid and dependable diagnosis of reading proficiency for different readers. But we can also easily diagnose the text itself by seeing at what speed it can be read. A reader-based text diagnosis of this kind would seem by all accounts to be more valid than LIX measurements or other statistical attempts at expressing the readability of a text.

Self-control via the "mouse" also provides us with an elegant method of studying reading strategies. We can see how different readers show different tendencies to alter their speed as the requirements of the passage are changed, and also the extent to which they pause and go back in the reading passage so as to secure relevant information or resolve ambiguities of reference. The strategic training opportunities which this affords are obvious. We can also study changes in the reading process in conjunction with different reading objectives.

So far we have conducted three major experiments in which the different possibilities of our methodology have been tested, with very promising results.

WHAT HAPPENS TO PUPILS WHO HAVE DIFFICULTY WHEN STARTING TO READ?

Sometimes one is surprised by the difficulty which some children have in learning to read although they seem otherwise to be well-developed intellectually. Many teachers probably like to think that everything

will be allright in the end, so long as these pupils are given time. They will doubtless catch up at intermediate level, it is hoped. Do they usually do so? We have taken a closer look at this question.

From a total of 700 grade 1 pupils, we selected 46 who were conspicuous underachievers in reading and writing at the end of grade 1 and the beginning of grade 2. Since then we have followed these pupils up to grade 6 and studied their development in a variety of respects. A match reference group comprising the same number of pupils, reading on a level with their intellectual capabilities, has been used for purposes of comparison. Space will only permit us to mention a few subsidiarly findings here.

When we get to grade 6, there are still very great differences between the groups. Half the pupils who had difficulties at junior level are below the standard of the very worst members of the reference group in grade 6. But 8 pupils have at least caught up and their achievement is in fact on a level with the average for the entire group (700 pupils). Thus there is scope here for both optimistic and pessimistic conclusions. On the one hand, it is sad to note that half the pupils are still in very great trouble. On the other hand, some of them have more or less overcome their problems. But we have not seen any particularly good readers and spellers among the pupils who were already diagnosed as poor readers during their first years of school. Perhaps one should be on one's guard against an excessively laissez-faire attitude at junior level.

We have also studied the development of self-image in both groups on four different occasions (grades 1, 2, 3 and 6). On all these occasions, the reference group had on average a more positive self-image than the poor readers. The connection between self-image and reading proficiency was also reflected by the fact that the pupils who had overcome their reading problems by grade 6 generally displayed a positive self-image development.

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